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**Tri-City Industrial Disposal Site**  
**Operable Unit Two**  
**Brooks, Bullitt County, Kentucky**

**Site:** \_\_\_\_\_  
**Break:** 59  
**Other:** Q12AR

12751

## **RECORD OF DECISION**



**U.S. ENVIRONMENTAL PROTECTION AGENCY**  
**Region IV**  
**Atlanta, Georgia**

**March 1996**

**DECLARATION FOR THE RECORD OF DECISION**

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**SITE NAME AND LOCATION**

Tri-City Industrial Disposal  
Highway 1526, Brooks Hill Road  
Bullitt County, Kentucky

**STATEMENT OF BASIS AND PURPOSE**

This document presents the decision made by the U. S. Environmental Protection Agency (USEPA) for the second phase of remedial action (Operable Unit #2) at the Tri-City Industrial Disposal Site. The decision was made in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), based on the information contained in the Operable Unit #2 Administrative Record for the site.

The Commonwealth of Kentucky Department of Environmental Protection (KDEP) is aware that USEPA has concluded its work on this Operable Unit. KDEP has not concurred with USEPA's decision at this time because it is pursuing an independent additional study of the site.

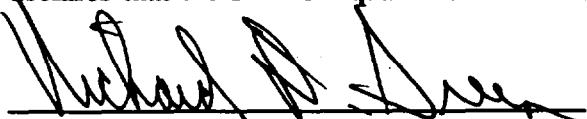
**DESCRIPTION OF THE REMEDY**

Based on the results of additional sampling at Tri-City, monitoring reports, and risk evaluation, no further remedial action is necessary at the site to ensure protection of human health and the environment. This decision is the final remedial action for the site.

Although EPA has determined that no additional Superfund action is warranted for the second operable unit, treatment and monitoring of contaminated groundwater (OU1) will continue at the site as necessary. The Record of Decision for the first operable unit outlines the groundwater remedial activities.

**DECLARATION STATEMENT**

Previous response actions at this site, including emergency removal and treatment of contaminated groundwater, appear to have eliminated the need for additional remedial action. The current decision for no further action is not expected to result in hazardous substances remaining on-site above health-based levels. Therefore, the five-year review requirement will not apply to this operable unit. EPA has completed its response action at this site and declares that the site now qualifies for Construction Completion status.



Richard D. Green, Acting Director  
Waste Management Division

29 MAR 96

Date

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## 1.0 SITE LOCATION AND DESCRIPTION

### 1.1 Site Location

The Tri-City Industrial Disposal Superfund Site is located in the community of Brooks in Bullitt County, approximately 15 miles south of Louisville, Kentucky. See Figure 1. The site consists of approximately 349 acres and it is located on the south side of State Highway 1526 (also known as Brooks Hill Road), approximately four miles west of U.S. Interstate 65 (see Figure 2). The geographical coordinates for the site are 38°2'50.9" north latitude and 85°46'06.1" west longitude.

### 1.2 Site Description

The site is located in the Blue Grass Region of the Interior Low Plateaus Physiographic Province. The Blue Grass Region lies within the Ohio River drainage basin and it is generally an area of rolling uplands which range in elevation from less than 800 feet above mean sea level (msl) in the northwest to about 1000 feet in the southeast. The site is within the Knobs Regional Subdivision of the Blue Grass Region.

The climate in the Blue Grass Region is moderate with a mean annual temperature of 67°F. The average annual precipitation in Bullitt County is 55 inches and the mean annual lake evaporation is 35 inches, resulting in a net precipitation of 20 inches.

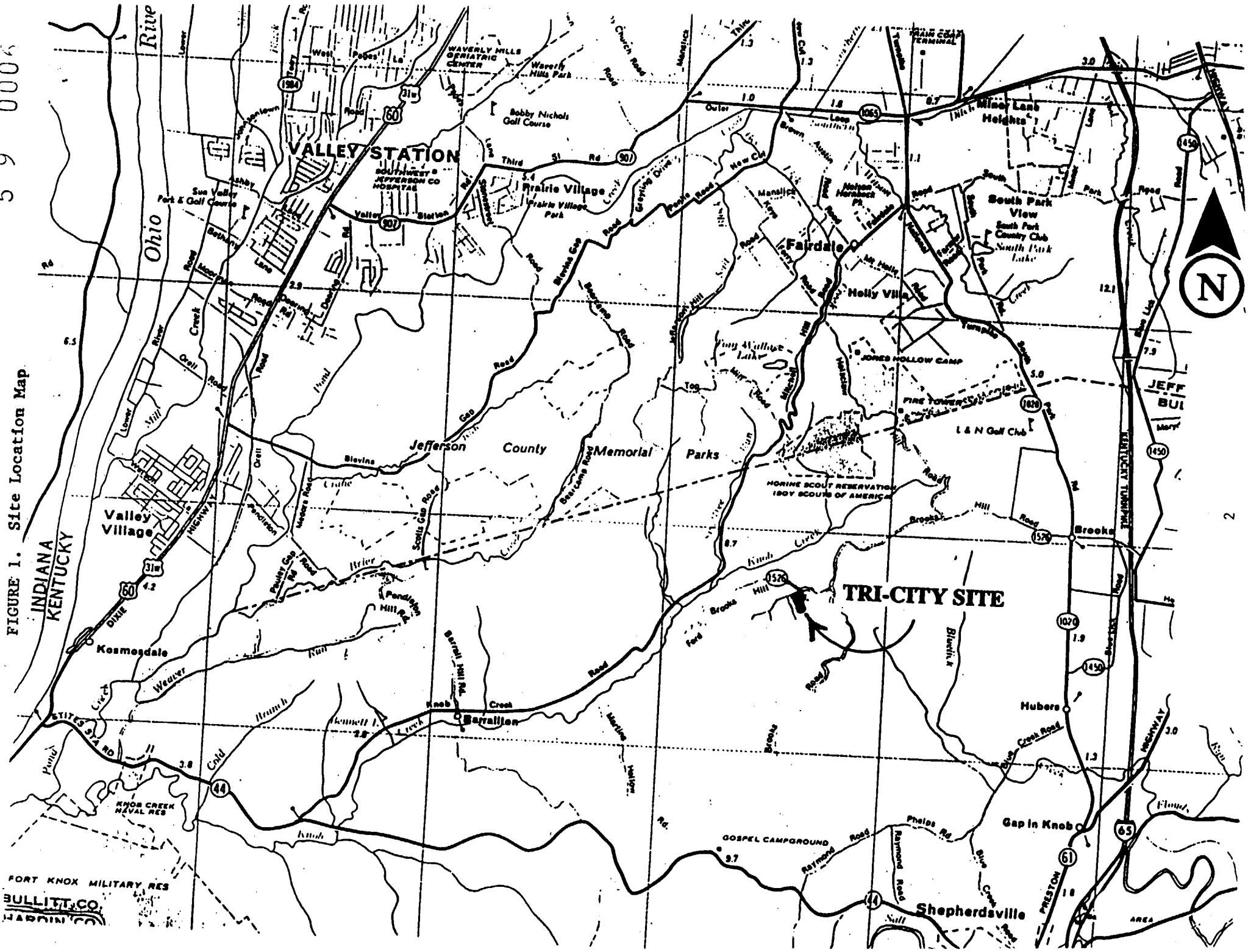
Approximately 300 people live within one mile radius of the site. The site and surrounding area are rural. The land use is predominantly agricultural and residential. Several residences exist on and adjacent to former disposal areas at the site. A portion of the site is used for agricultural purposes, mainly as pastures and small gardens. Other areas of the site are covered with grass and trees. Notable surface features on-site include a shallow trench partially filled with water at the southern end, and two shallow ponds which are used to water livestock.

Situated on a broad ridge known as the Beghtol Ridge, the site slopes moderately to the south. The elevations across the site range from 800 feet to 840 feet above msl. The southern boundary and portions of the eastern and western boundaries drop into steep, vegetated ravines with bottom elevations ranging from 600 feet to 800 feet above msl.

The original soils of the site are classified as Crider Silt Loams which are formed on long, steep hillsides and broad, gently

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FIGURE 1. Site Location Map



FORT KNOX MILITARY RES  
BULLITT CO.  
HARDIN CO.

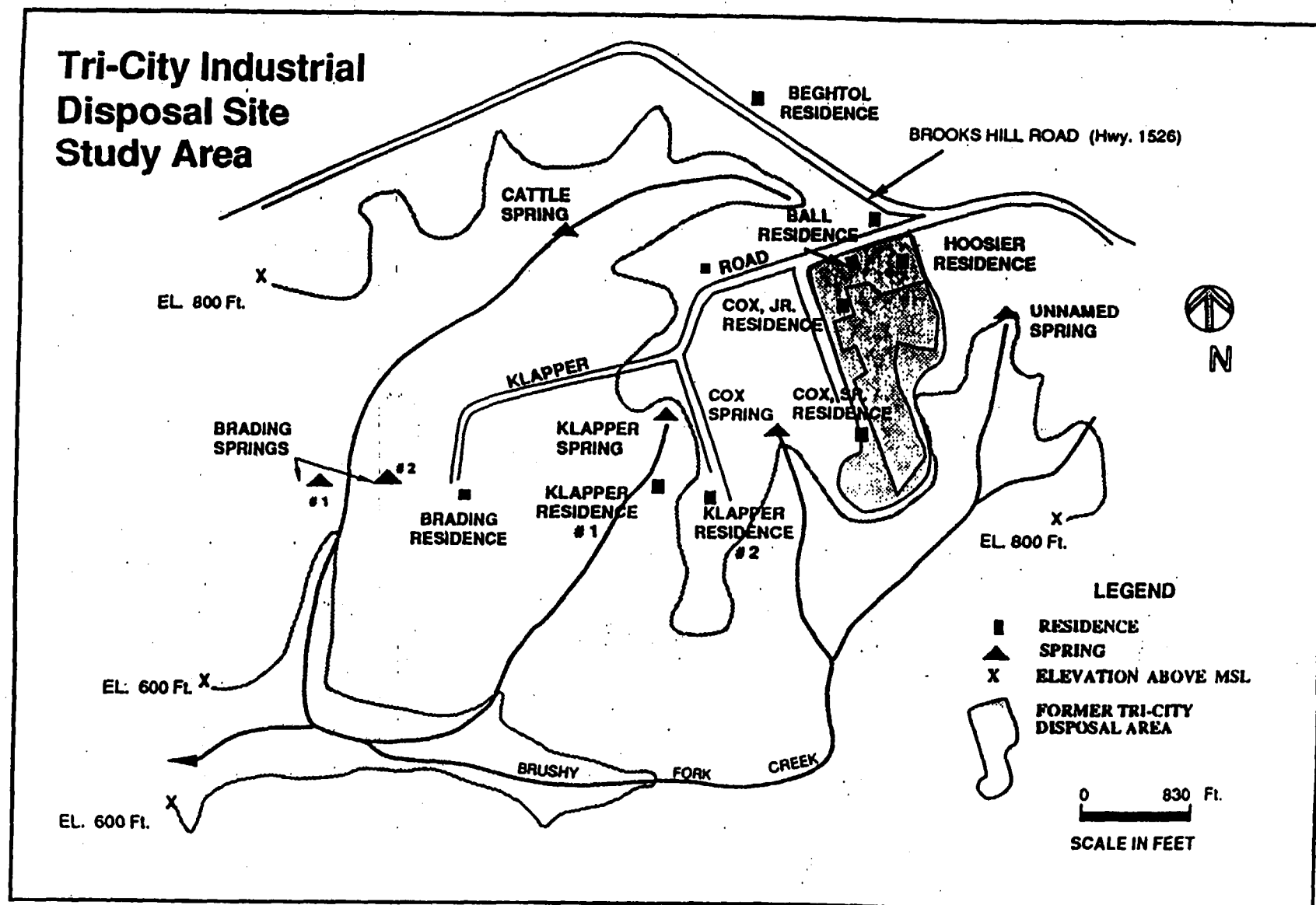


FIGURE 2. Site Layout



sloping to moderately steep ridge tops and shoulder slopes above deep valleys. Crider soils are described as deep and well drained with upper loamy zones and subsoils containing a high proportion of clay.

The site is drained to the west, south, and east by Brushy Fork Creek which is a perennial stream. The springs and seeps at the site represent sources of groundwater which contribute to surface water runoff to Brushy Fork Creek. The source for the creek is a small spring approximately 3,000 feet southeast of the site at an elevation of approximately 750 feet above msl. Brushy Fork Creek flows westward for approximately two miles where it joins Knob Creek and becomes part of the Ohio River drainage network.

Brushy Fork Creek is used seasonally for recreational purposes and for irrigation of nearby farms. The creek appears to be a healthy stream supporting diverse communities of macroinvertebrates and small fish. Adequate feeding habitat for endangered species of bats and the bald eagle were determined to be absent within Brushy Fork Creek and the tributaries which are affected by the site.

The site is not located in a 100-year floodplain. According to the U.S. Fish and Wildlife Service (FWS), the Brushy Fork Creek is not a habitat for endangered species and the site is not on a wetland, nor does it affect a wetland.

## 2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

### 2.1 Site History

The site was an industrial waste landfill known to have been operated by Tri-City Industrial Services, Inc. from late 1964 to late 1967. The majority of the material reportedly disposed of at the Site was from several Louisville, Kentucky industries. The bulk of the waste consisted of scrap lumber and fiberglass insulation materials. The remaining waste consisted of drummed liquid wastes and bulk liquids that were poured onto the ground. In 1968, State officials reported that highly volatile liquid wastes resembling paint thinners were disposed of on-site.

Records indicate that an attendant was present at the site at least during a portion of the time that the landfill was operated. The duties of the site attendant included pushing each day's collection of refuse over the working face of the landfill into the surrounding ravines. In at least one instance, the attendant was instructed to pour liquid waste material directly onto the ground to help alleviate fire and explosion hazards.





The site was a source of local citizen complaints and concerns to state and county government officials on numerous occasions during the disposal operations. In 1965, residents near the site first complained to local officials regarding the unkempt condition of the landfill, explosions, fires, and smoke which was said to irritate eyes. The residents also reported breathing difficulties and frequent offensive odor. Additionally, deposition of ash and fire debris on neighboring property led to a civil lawsuit for creating a public nuisance.

The Bullitt County Health Department, County Attorney, and the Commonwealth of Kentucky Department of Fish and Wildlife Resources (then the Division of Fisheries) along with the Department of Health (then the Division of Environmental Health) investigated these complaints. An indictment, served to Tri-City Industrial Services, Inc. and others in November 1967, resulted in the arrest of the company's president, Mr. Harry Kletter, on the nuisance charge. After Mr. Kletter's arrest, a settlement was negotiated whereby the charges would be dropped if the company agreed to stop disposing of and burning waste at the site. At about the same time as the arrest, a fire erupted on the site that burned for two years. Tri-City Industrial Services, Inc. reportedly ceased all waste disposal activity shortly after the fire began.

## 2.2 Initial Investigations

EPA's involvement with the site commenced in 1985, following notification by the Kentucky Natural Resources and Environmental Protection Cabinet. The Cabinet conducted a Preliminary Assessment (PA) of the site in September 1985, and recommended a high priority for inspection. The Cabinet performed a Site Investigation (SI) in April 1987, to determine the site's eligibility for inclusion on EPA's National Priority List (NPL). The investigation included identification of several private, potable water supplies near the site and multi-media sampling (waste, soil, and groundwater). Several hazardous substances were detected in site soils and wastes, including PCBs, phenols, heavy metals, and various organic compounds. One residential spring, utilized by the Klapper family as a source of potable water and located several hundred yards west of the site, was sampled and found to contain levels of tetrachloroethene (also known as perchloroethylene, or PCE) above Maximum Contaminant Levels (MCLs).

Following the Cabinet's release of the sampling results, EPA conducted additional sampling and provided an alternate water supply to the two Klapper residences in May 1988. EPA also discovered that another spring closer to the Site was being used as a source of potable water by Mr. and Mrs. William D. Cox, Sr.



RECORD OF DECISION  
TRI-CITY INDUSTRIAL DISPOSAL

Bottled water was supplied to the Cox, Sr. residence until sampling results were obtained. Sampling of the Cox Spring was included in a May 1988, survey of potable water sources conducted by EPA within a radius of approximately one-half mile of the site. The sampling confirmed again the presence of PCE in the Klapper Spring, and elevated levels of PCE and trichloroethene (TCE) were found in the Cox Spring. This survey identified the two Klapper residences and the Cox, Sr. residence as the only affected households within the investigated area.

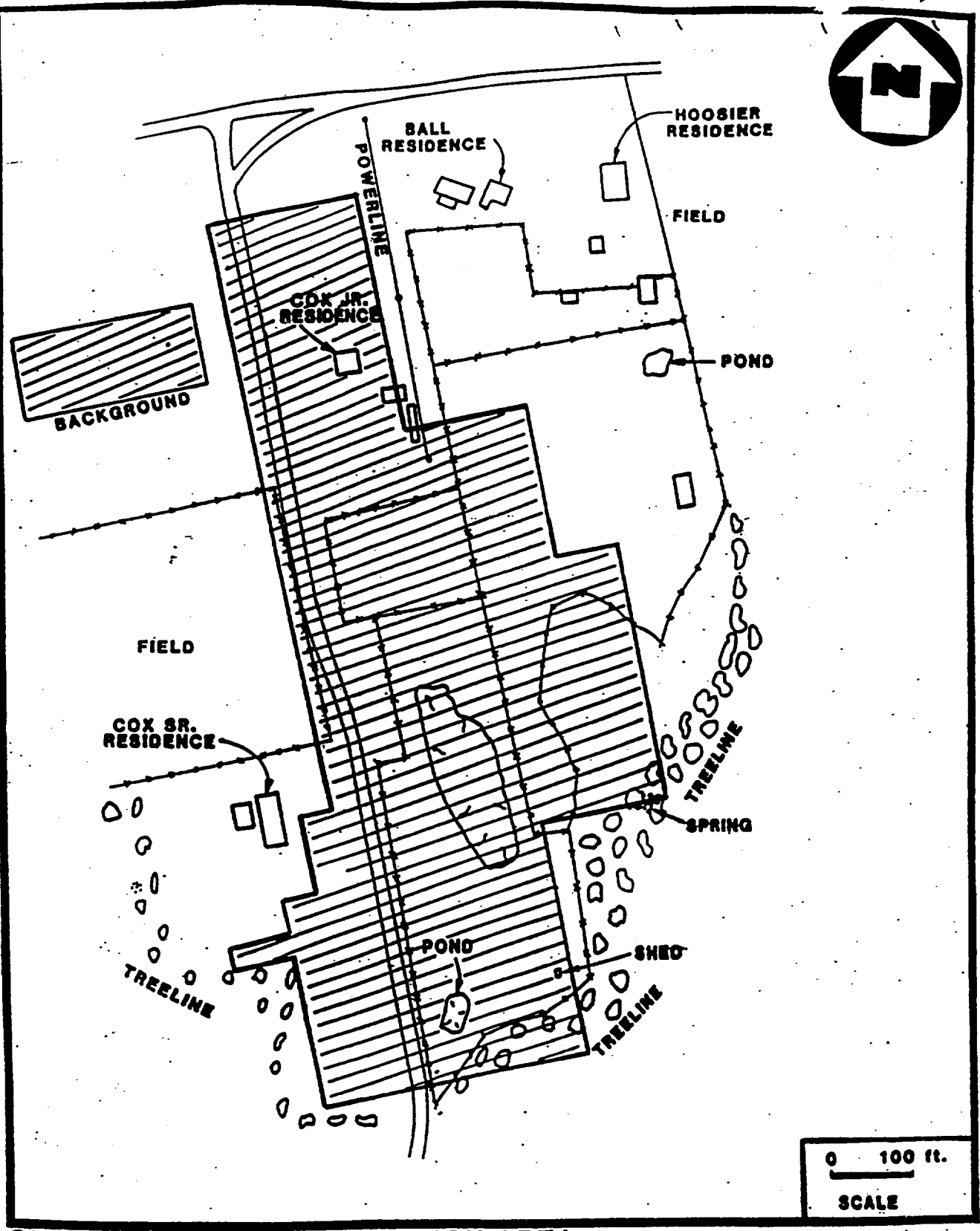
The findings of the potable water survey prompted EPA to conduct an additional study in June 1988. The emphasis of the study was to assess the site's potential impact on area residents via ingestion of groundwater, inhalation of soil dust, and direct contact. Sample locations included sensitive areas such as yards, gardens, and potable water supplies from where five composite surface soil samples, three waste samples, and four groundwater samples were collected.

The site was proposed for inclusion on the NPL on June 24, 1988, (53 FR 23988) based primarily on the potential hazard from contaminated groundwater. The site became final on the NPL on March 31, 1989, (54 FR 13302) with a Hazard Ranking Score (HRS) of 33.82.

### 2.3 Removal Actions

The site received further attention in June 1988, when EPA responded to a telephone call from the Cox, Sr. family regarding a "black ooze" emanating from their side yard. EPA's Technical Assistance Team (TAT) contractor, Roy F. Weston, collected two samples from the reported stained area and also from a solid material resembling paint waste. The samples indicated elevated levels of xylene, toluene, ethylbenzene, and lead.

NUS Corporation, EPA's Field Investigation Team (FIT) contractor, conducted a geophysical survey and field analytical screening procedures (FASP) at the site in August 1988, to delineate waste disposal areas and provide additional subsurface information. Magnetometry, resistivity, and electromagnetic terrain conductivity surveys were performed during the geophysical investigation. The study area is shown in Figure 3. The results of the electromagnetic and magnetic surveys are shown in Figures 4 and 5, respectively.

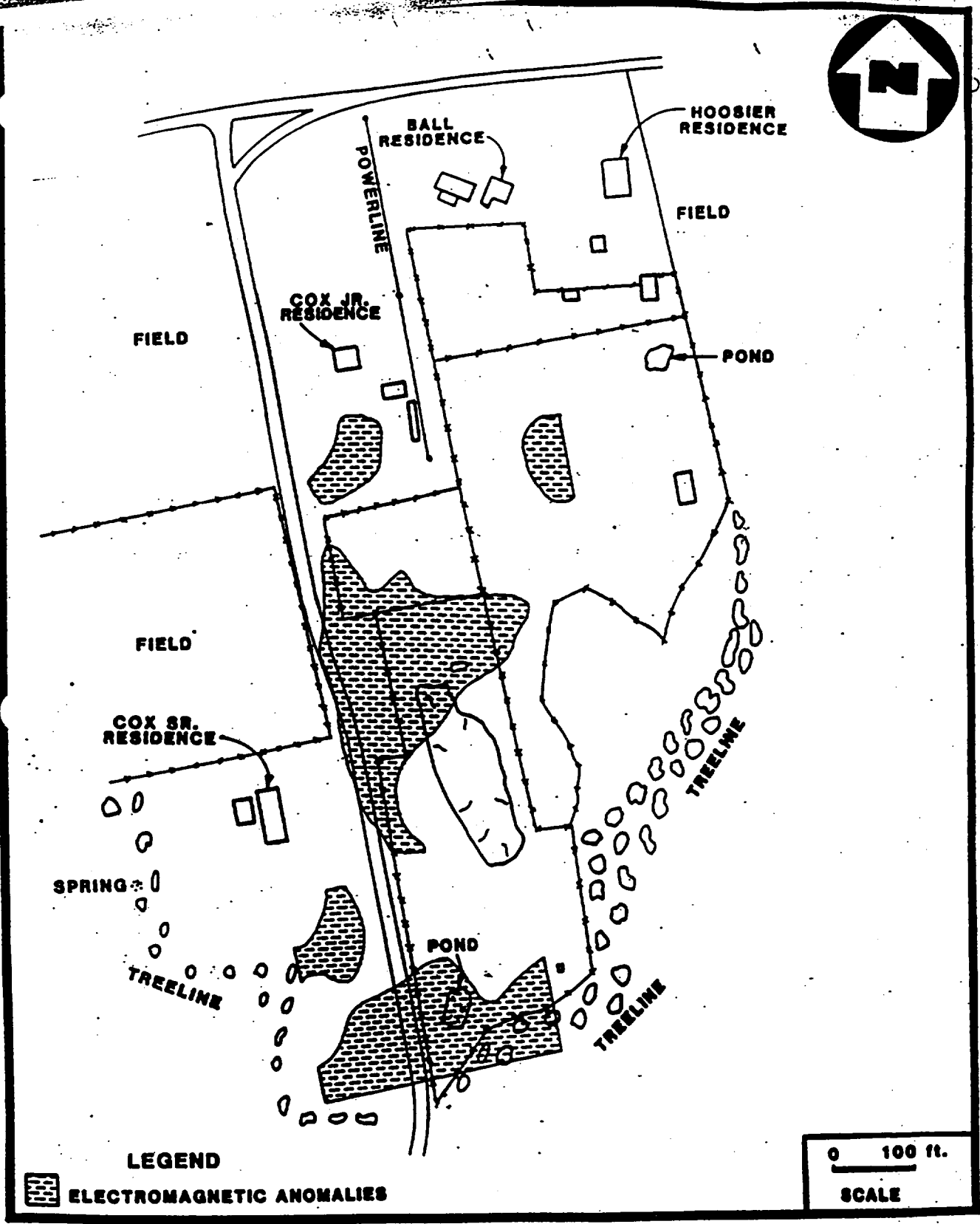


**GEOPHYSICAL INVESTIGATION AREA  
TRI-CITY INDUSTRIAL DISPOSAL  
BROOKS, BULLITT COUNTY, KENTUCKY**

**FIGURE 3**



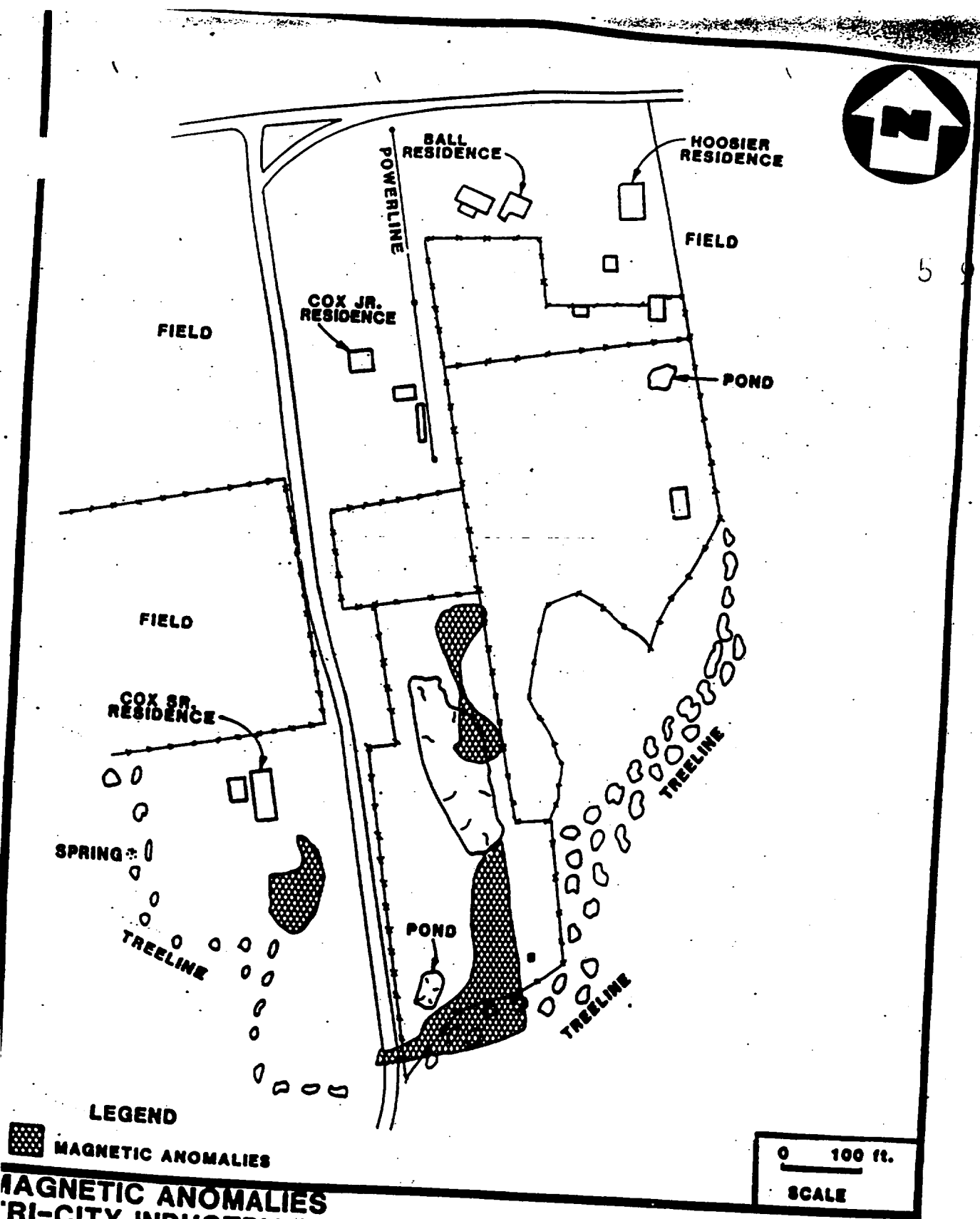
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**ELECTROMAGNETIC ANOMALIES  
TRI-CITY INDUSTRIAL DISPOSAL  
BROOKS, BULLITT COUNTY, KENTUCKY**

**FIGURE 4**





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**MAGNETIC ANOMALIES**  
**TRI-CITY INDUSTRIAL DISPOSAL**  
**WYOMING, BULLITT COUNTY, KENTUCKY**

**FIGURE 5**





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The results of the FASP were found to substantiate the geophysical findings by detecting VOCs in significant concentrations close to the anomalies. Based on the correlation between the two surveys, waste disposal at the site was determined to be concentrated at the southern half of the landfill.

Based on the results of the sampling conducted by EPA's TAT contractor and the proximity of the contamination to the Cox, Sr. residence, EPA conducted an Emergency Removal Action in August and September 1988, to excavate and remove approximately 165 drums containing chemicals, many crushed and empty drums, metal containers of various sizes, auto parts, 400 gallons of free liquids, and over 800 cubic yards of suspected contaminated soil. The resulting trench in the side yard was approximately ten feet deep, twelve to fifteen feet wide, and thirty feet long.

Following this removal action, numerous test trenches were employed to identify additional waste disposal areas. The results of previous geophysical surveys were used to aid in determining the trenching locations. As shown in Figure 6, the trenches were excavated in the Cox, Sr. side yard, throughout a pasture east of the Cox, Sr. residence, and on the Hoosier's property of more than five acres in size. A number of empty drums and drums containing solids were excavated and staged, but no additional liquids were located. In addition, the operators encountered fiberglass insulation materials, wires and ashes, probably from the historical fires. The test excavation was discontinued in September 1988, and the trenches were backfilled and graded.

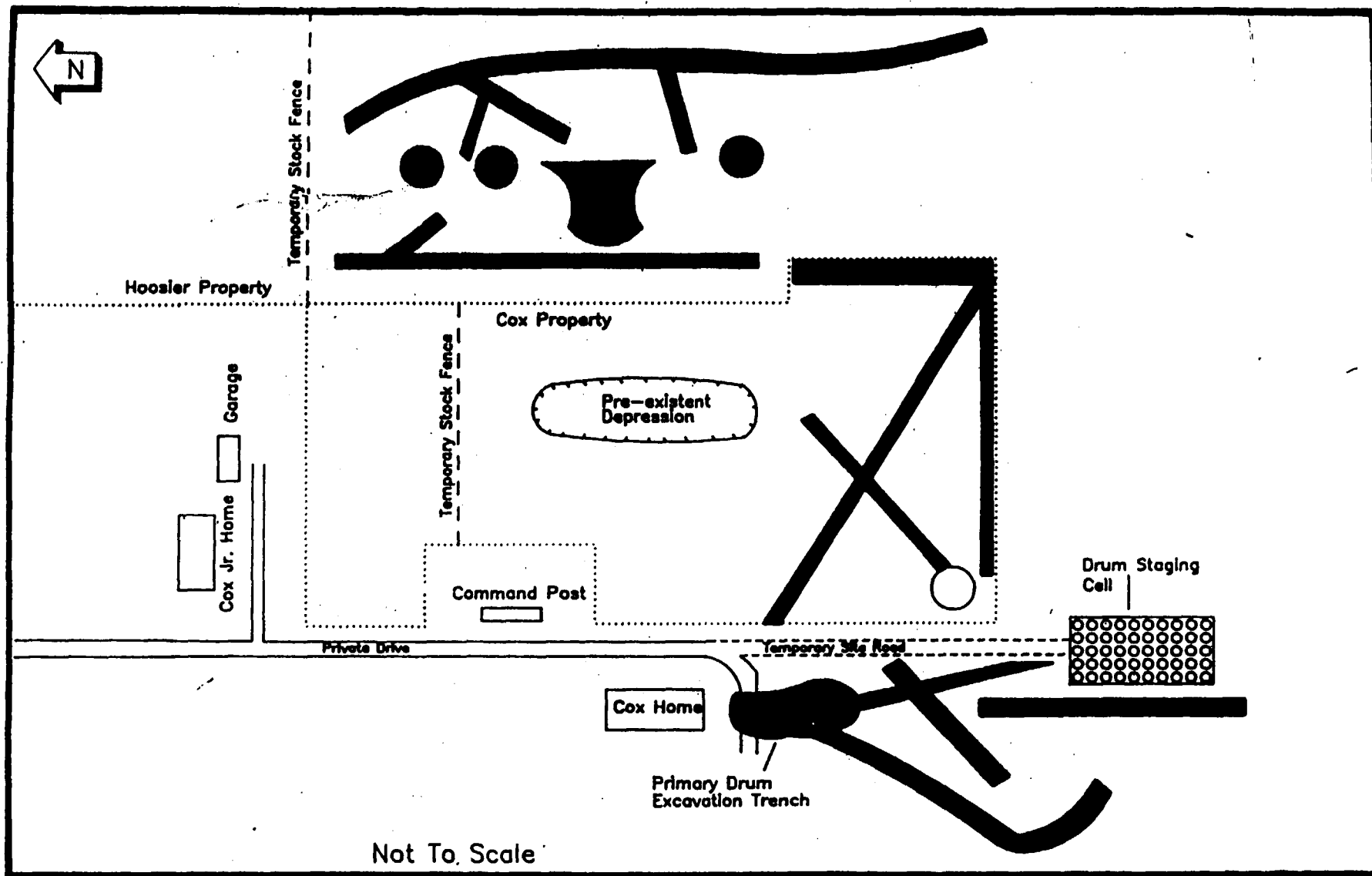
#### 2.4 Remedial Investigation/Feasibility Study (OU1)

In November 1988, and May 1989, EPA invited the parties responsible for the wastes at the site (PRPs) to conduct a Remedial Investigation (RI) in order to determine the nature and extent of contamination. The PRPs elected not to undertake the studies. Therefore, EPA began the RI in July 1989. Since the geophysical survey and FASP indicated that the disposal of waste was concentrated in the southern half of the landfill, the field activities of the RI were concentrated in that area.

The RI activities included topographic mapping, geological assessment, surface water and sediment sampling, spring sampling, surface and subsurface soil sampling, ecological studies, geophysical evaluation, groundwater studies, aquifer tests, and air monitoring. All work was conducted by EPA's contractor, Ebasco Services, Inc.

During the RI, six groundwater monitoring wells were installed and sampled. Installation of seven other wells was attempted. The wells were not completed because of insufficient groundwater.

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WESTON MAJOR PROGRAMS Region IV TAT

ACTIVITY DESCRIPTION: Size Edited Site Sketch With

Approximated Test Pits and Trenches **FIGURE**

SITE: Tri-City Industrial Disposal Site

TDD NO.: 04-8810-20 PCS# 2020

DATE: July 1989



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The RI activities included topographic mapping, geological assessment, surface water and sediment sampling, spring sampling, surface and subsurface soil sampling, ecological studies, geophysical evaluation, groundwater studies, aquifer tests, and air monitoring. All work was conducted by EPA's contractor, Ebasco Services, Inc.

During the RI, six groundwater monitoring wells were installed and sampled. Installation of seven other wells was attempted. The wells were not completed because of insufficient groundwater. Initially, four springs were sampled, and six surface water samples were taken from Brushy Fork Creek and the two tributaries that discharge to the creek. Twelve sediment samples were collected in the areas of the springs and Brushy Fork Creek. Twenty surface soil samples and twenty-five subsurface soil samples were collected. In addition, sixteen air samples were collected at three locations that were selected based on prevailing wind directions and the locations of residents. The final stage of the RI field activities included additional sampling of one monitoring well and several springs, including the Cox and the Klapper springs in December 1990, to verify previous sampling results.

Following the RI, the Feasibility Study (FS) was conducted to evaluate remedial alternatives for addressing the site's contamination problems. The study was completed in April 1991. Reports of the RI and FS were published in May 1991.

## 2.5 RECORD OF DECISION (OU1)

Based on the results of the RI and FS studies, EPA selected a preferred cleanup plan for the site after consultation with Kentucky officials and the public. The cleanup plan which was detailed in the Record of Decision (ROD) issued in August 1991, included the following. (1) treatment of contaminated groundwater, (2) continued provision of drinkable water to affected residents, (3) temporary restriction of groundwater usage, (4) confirmatory sampling of site soils, sediment and air to ensure that all possible areas of contamination are investigated, and (5) long-term monitoring of groundwater, sediment, and ecology to identify additional site-related impacts. The ROD further specified that the results of the Confirmatory Sampling would be evaluated by USEPA and designated OU2 to address the findings of the evaluation.





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## 2.6 REMEDIAL DESIGN/REMEDIAL ACTION (OU1)

In March 1992, three of the PRPs, Ford Motor Company, Waste Management of Kentucky, Inc., and Dow Corning Corporation agreed to implement and fund the Remedial Design and Remedial Action (RD/RA) which OU1 ROD required. Under a contract with the PRPs, RUST Environmental and Infrastructure performed the RD/RA activities. USEPA and Kentucky officials reviewed and/or inspected the various phases of RUST's work before approval.

In November 1992, Rust began the RD/RA field activities at the site. Long-term monitoring of groundwater, surface water, sediment and ecology for site-related impacts was initiated. Performance Standards Field Sampling for baseline data and for managing groundwater treatment at the site was conducted. In addition, Confirmatory Sampling required by the ROD for OU1 was accomplished.

The results of the sampling events formed the basis for the RD which included a comprehensive equipment specification, construction layout and management plan, quality control provisions and other components of the groundwater treatment system for cleaning contaminated springs at the site. Details of the RD are contained in two reports, (Final Remedial Design Report and Final Remedial Action Work Plan). These were made available to the public at the repositories for the site in 1993.

Construction and installation of the RA facilities were completed in June 1994, including two separate systems of flow lines, temporary holding tanks, pumps and granular activated carbon adsorption beds. The two affected springs (Cox and Unnamed Spring #1) were remediated concurrently by pumping contaminated water from each spring through the appropriate carbon adsorption system. The springs were sampled regularly to monitor progress of the remediation process. USEPA certified that the groundwater cleanup was complete in May 1995, after several analytical results consistently indicated that the cleanup goals established for the compounds of concern were met.

USEPA initiated supplying potable water to affected residents in May 1988, to prevent the use of the contaminated springs. Although, the springs have been remediated, the PRPs have continued to supply drinkable water where necessary and are in the process of connecting affected homes to the public water system. Usage of the springs remains restricted by institutional control.

Long-term monitoring activities as well as Operation and



Maintenance of the site are in progress at this time. Results of laboratory analyses and progress reports prepared monthly by the PRPs are reviewed regularly by USEPA. Current evaluations indicate that conditions at the site are stable and are protective of human health and the environment.

### 3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan (CRP) for the Tri-City Site was finalized in May 1989. This document included a list of contacts and interested parties throughout government and the local community. The CRP also established how USEPA would ensure timely dissemination of pertinent information to the public.

A fact sheet describing the site and the nature of the RI/FS process was distributed to the public in May 1989. USEPA held an availability session in Shepherdsville, Kentucky on June 1, 1989, to discuss site-related problems, the process of site evaluation and the procedures for choosing the necessary clean-up measures.

On April 19, 1991, a Proposed Plan Fact Sheet (OU1) was published to announce EPA's preferred alternative for site remediation in two phases (two operable units). The document elaborately discussed various cleanup options for OU1 and solicited comments from the public on USEPA's preferred alternative. The comment period began on May 2, 1991, and ended on June 1, 1991. During the period, a Public Meeting was held locally to discuss the Proposed Plan. All comments received by USEPA during the period were addressed in the Responsiveness Summary section of the ROD for OU1.

The Proposed Plan Fact Sheet for OU2 was distributed on January 25, 1996. The Fact Sheet announced that no further Superfund Remedial Action was warranted at the site based on the results of the Confirmatory Sampling conducted under OU1 and because previous response actions at the site have been successful. Comments on the proposal were requested to be submitted to USEPA by February 29, 1996. No comments were received on the proposal.

All pertinent information used by USEPA to select CERCLA response actions for both Operable Units has been included in the Administrative Records at the information repositories. The repositories, located in the Ridgeway Memorial Library, Shepherdsville, Kentucky and EPA's Records Center, Atlanta, Georgia were established in 1989.

In summary, USEPA provided ample opportunity for community involvement throughout the duration of the project. With respect to interpreting and understanding the technical aspects of the



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project, availability of the Technical Assistance Grant was announced to the public at the early stage of the project.

#### 4.0 SCOPE AND ROLE OF RESPONSE ACTION

By the time OU1 ROD was finalized for this site, an extensive contaminant source characterization had been accomplished by conducting numerous sampling and laboratory analyses. Contaminant source areas were well defined including locations where contaminated soils, groundwater or other media could release hazardous materials through leaching or other mechanism into the environment. As a result of the efforts, several containerized wastes and liquids were removed from the surface of the site. In addition, contaminated soil and other buried hazardous materials were excavated and properly disposed of. At that point, all that remained was to verify that all contaminant source locations had been investigated. Because local residents used springs predominantly for potable water, it was decided to initiate immediate cleanup of the contaminated groundwater. Management of any unacceptable health and/or environmental risks, not associated with contaminated springs, found by verifying the results of previous investigations and source removals was deferred to OU2. Thus, the scope and role of OU2 response action were defined specifically as the confirmatory sampling of site soils, sediment, and ambient air, and their cleanup, if needed.

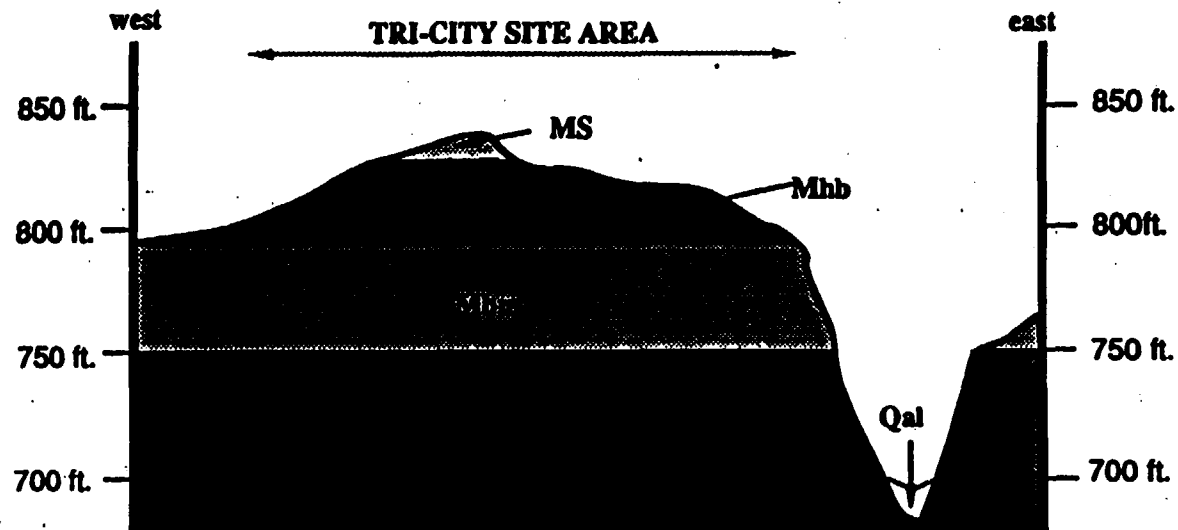
#### 5.0 SUMMARY OF SITE CHARACTERISTICS

##### 5.1 Site Geology and Hydrogeology

The local geology at the Tri-City site is dominated by sedimentary rocks of Mississippian age. These formations include (from top to bottom), the Salem Limestone, the Harrodsburg Limestone, and members of the Borden Formation (the Muldraugh, the Holtsclaw Siltstone, and the Nancy). The stratigraphy of the area is shown in Figure 7.

The Salem formation, consisting of limestone and shale, forms the caprock on most of the hills in the Knob Region, west of Sun Rise Ridge. Formation thickness in the vicinity of the site ranges from 18 to 25 feet. The contact of the Salem Limestone with the underlying Harrodsburg Limestone is generally identifiable by the weathered, silicified bed of granular limestone with fossil fragments.

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#### LEGEND

	Qal	QUATERNARY ALLUVIUM
	MS	SALEM LIMESTONE
	Mhb	HARRODSBURGH LIMESTONE
BORDEN FORMATION	Mbm	MULDRAUGH MEMBER
	Mbh	HOLTSCRAW MEMBER



GENERALIZED GEOLOGICAL CROSS SECTION  
TRI-CITY INDUSTRIAL DISPOSAL SITE  
BULLITT COUNTY, KENTUCKY

FIGURE 7



The Harrodsburg forms the caprock on most of the ridges and consists of fragmented limestone. The Harrodsburg is underlain unconformably by Muldraugh, a member of the Borden formation.

The surficial aquifer, composed of the Salem Limestone and the Harrodsburg Limestone, is unconfined with thickness of between 10 and 50 feet. The groundwater moves along preferential flow pathways within the irregular contact between the partially decomposed and completely decomposed overburden, thin fractures, and the solution channels along the bedding planes. Springs and seeps sporadically occur where the geologic units that comprise the aquifer are exposed.

The various members of the Borden formation consist of varying proportion of dolomite, siltstone, limestone and shale. Groundwater flows through interconnected fractures, bedding planes, and dissolution pathways in the formation.

The formations at Tri-City are generally productive. However, because productivity of wells in the aquifers is sporadic and unpredictable, springs are used as water supply sources more frequently than water wells in the area.

Recharge to the aquifers occurs in the area, principally by infiltration of precipitation into the overburden or by infiltration of runoff directly into the aquifers. Most of the infiltration appears to occur in the northern part of the site (near the Cox, Jr. and Hoosier homes) where the overburden is thin due to past earthmoving operations. Movement of groundwater occurs predominantly down-dip to the south-southwest, primarily along bedding planes. The groundwater appears to discharge through springs and seeps which are located mostly on the south and west sides of the site.

Hydraulic communication between the different aquifers at the site is appreciable based on hydrogeologic data. Also, the overburden and the Salem /Harrodsburg aquifer appear to communicate effectively based on analyses of spring samples.

## 5.2 Nature and Extent of Contamination

The primary objective of this Operable Unit is to define and address additional cleanup requirements at Tri-City following the removal and other response actions already conducted at the site. Groundwater issues were assigned exclusively to OU1. Therefore, determining the nature and extent of contamination for OU2 concentrated on the following:

1. Sampling of soils and surface water to assess the



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effectiveness of the emergency removal performed in 1988 near Cox, Sr. residence. The primary contaminants of concern were metals, perchloroethylene (PCE), toluene, ethyl benzene, xylene, and polychlorinated biphenyls (PCBs). These compounds were found in drummed wastes during removal actions.

2. Sampling of the disturbed area in the northern portion of the site to investigate possible contamination from drum disposal.
3. Sampling of surface soils along the eastern edge of former disposal area where polycyclic aromatic hydrocarbons (PAHs) and one species of PCB (Aroclor 1254) were found during OU1 RI.
4. Sampling of sediment in the tributary of the Brushy Fork creek where one previous sample indicated elevated levels of chromium and lead concentration.
5. Air sampling along the slope of the Cox Lobe to identify the source of one instance of detected PCE during the RI for OU1.

The sampling events described below were performed in November 1992, by the PRPs as specified by USEPA. The results were presented in the "Sampling and Analysis Summary Report - November 1992 Quarterly Sampling Events, Operable Unit No.1 Remedial Design Volumes 1 - 3," of February 1993. Copies are in the Administrative Record for this ROD.

#### 5.2.1 Surface Soils

Ten samples of surface soil were collected along the eastern edge of the former disposal area to establish the extent of any residual PAH or PCB. PAHs were not detected in the samples. PCB Aroclor 1254 was found at below detection limit in two samples and at the concentration of 66 ppb in one sample.

#### 5.2.2 Subsurface Soils

Thirty-two subsurface samples were analyzed, including duplicates, from eleven borings at the site. Six of the borings were drilled in the drum removal area, adjacent to the Cox, Sr. residence. The other five borings were drilled in the northern portion of the site where disposal or storage of drums was suspected. The samples represented soils from 7 to 20 feet below the ground surface. The following is a summary of the analytical results for the various compounds detected in the removal area and the northern portion of the site.



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REMOVAL AREA

(21 SAMPLES ANALYZED)

COMPOUND	AVERAGE CONC. PPB	# OF SAMPLES AFFECTED
1,2 Dichloroethene (DCE)	537	6
2-Butanone	418	4
4-Methly-2-Pentanone	880	2
Acetone	1400	15
Ethylbenzone	2400	8
Styrene	510	1
Toluene	6100	7
Trichloroethene (TCE)	740	1
Xylenes	149000	9
2-Methlyphtalene	910	1
Bis(2-Ethlyhexyl)phthalate	470	2
Nephtalene	1000	1
Aroclor 1254	150	3
Aroclor 1260	470	1

NORTHERN AREA

(11 SAMPLES ANALYZED)

COMPOUND	AV. CONC., PPB	SAMPLES AFFECTED
Acetone	52	8
Tetrachloroethane (PCE)	60	2
Toluene	21	2

5.2.3 Surface Water

One surface water sample was collected from each of the three ponds near the removal action and the northern portion of the site. Laboratory analysis of the samples did not reveal presence of landfill contaminants.

5.2.4 Sediment

Nine sediment samples from the Brushy Fork Creek were analyzed for contaminants of concern. Acetone was detected at a concentration of 140 ppb in one sample. Two samples contained chromium at the concentrations of 85 ppb and 89.9 ppb respectively. Lead was found in four samples at concentrations of 38, 36, 280 and 67.3 ppb respectively. In one sample, nickel was detected at a concentration of 32 ppb.



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#### 5.2.5 Air

Five air samples were taken along the slope of the Cox Lobe to confirm the presence and source of PCE identified during the RI for OU1. PCE was not detected in any of the current samples.

#### 6.0 SUMMARY OF SITE RISKS

USEPA is directed by CERCLA to protect human health and the environment from current and future exposure to hazardous substances at Superfund sites. At Tri-City, EPA has taken several steps to eliminate unacceptable risk to human health and the environment. Previous response actions included:

1. Removal of contaminated soil, containerized chemicals stored at the site and buried wastes to eliminate further release of hazardous materials to the environment.
2. Provision of potable water to affected residents and imposition of restriction on usage of spring water.
3. Remediation of polluted springs per OU1 ROD.

The present operable unit was planned to mitigate human health and environmental risk from exposure to hazardous materials possibly remaining at the site following the above remedial activities. Therefore, USEPA Region IV Risk Assessment Department evaluated the confirmatory sampling results and the Baseline Risk assessment for OU1. In addition, the Region studied reports on previous response actions and the on-going site performance monitoring.

A review of the confirmatory sampling results (Section 5) indicates that landfill related contaminants were measured at elevated concentrations in various relatively small percentages of the surface soil, subsurface soil and sediment samples. The interpretations of the results follow.

#### Surface Soil

The most notable chemical found in the surface soil at the site during previous sampling efforts included three carcinogenic and one non-carcinogenic PAHs, and Aroclor 1260 which is a PCB. These were found in one of twenty samples collected from the southern portion of the Cox Lobe. These contaminants were below their respective detection limits in the other nineteen samples. Risks were calculated based on the one positive sample during the Baseline Risk Assessment. The BRA examined two potential future pathways, ingestion of garden vegetables and ingestion of beef. Maximum literature values were assumed in modeling the risks





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associated with these pathways. The risk associated with ingestion of beef was calculated at approximately  $1.6E-4$  with a Reasonable Maximum Exposure (RME) of 43 ppb. Actual concentration value of 490 ppb was measured for the sample. Because this risk slightly exceeds USEPA's acceptable range, the confirmatory sampling of surface soil was conducted. PAHs were not detected during the confirmatory sampling. Aroclor 1254 was below detection limit in two of ten samples and was detected at 66 ppb in one sample. All three samples were from the vicinity of the previous positive sample within the Cox Lobe. Therefore, presence of this compound at the site, most likely, was isolated and has been minimized effectively by previous removal action. The concentrations of PCB detected are below levels that would pose unacceptable human health risk.

#### Subsurface Soil

As in the previous cases involving fifty subsurface soil samples, the current thirty-two samples exhibited presence of volatile organic compounds (VOCs) predominantly. These contaminants were detected as before, mainly in samples from the former emergency removal area. The samples containing the compounds and the concentrations detected did not suggest a wide spread case of contamination or levels that pose a risk to human health or the environment. Similarly, the levels of semi-volatiles and PCBs detected are deemed inconsequential as threats to human health or the environment.

The major concern for the presence of these compounds in the subsurface soils is their potential effect on groundwater. Therefore, fate and transport processes for the compounds were reviewed as well as groundwater monitoring reports.

The VOCs constituting majority of the chemicals in the subsurface are soluble and leachable into water. As an evidence, several of these compounds were detected at unacceptable levels in samples of spring water during previous investigations. The affected springs were remediated and are being monitored monthly. Reports of approximately one year of monitoring have indicated that levels of these compounds in the groundwater are no longer a threat to human health or the environment. Therefore, the presence of VOCs in the subsurface soil at the site does not constitute a significant concern at this time. The current condition indicates that these compounds are no longer present in the soils in soluble and/or leachable quantity, apparently due to the success and effectiveness of emergency removal actions at the site.

Semi-volatiles and PCBs detected in the soils are unlikely to dissolve or leach into the groundwater due to their relatively



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high sorption properties. Therefore, they pose limited contamination threat to the groundwater.

#### Sediment

An ecological evaluation of the sediment contamination data has concluded that despite exceedance of Sediment Screening Values, no sediment cleanup is warranted at the site. The evaluation has observed that the aquatic communities present in the area streams (Cox Spring Run and Brushy Fork Creek) do not reflect a significant impairment from site related toxicity. The Cox Spring Run is small. Therefore, it does not possess an appreciable capacity to support aquatic communities. Due to the intermittent flow characteristic of the Brushy Fork Creek, it will continue to provide a limited aquatic habitat. Removal of sediments from these streams would cause greater impairment than presently exists.

As discussed previously, contaminants in site soils are below risk levels. Therefore, eroded and runoff materials from the site which may become part of the sediment are not expected to impact the streams or aquatic biotas adversely.

#### 7.0 CONCLUSION

For the purpose of OU2, no remedial action will be taken at Tri-City, because the site does not pose an unacceptable risk to human health or the environment. Previous emergency response activities at the site were successful and the removal actions accomplished have reduced sources of contaminants to levels within acceptable risk. If the on-going monitoring events at the site, additional information and/or new data reveal an unacceptable risk, EPA may initiate further CERCLA clean-up actions without re-ranking the site.

At this time, the Commonwealth of Kentucky is pursuing additional field sampling and evaluation. As expected, results of the first round of Kentucky's re-sampling efforts recently indicated that the target compound, Dioxin, was below USEPA action level. The Region will continue to monitor Kentucky's results.

This document finalizes USEPA's response action at the site other than evaluating reports of the monitoring activities being conducted under OU1. Therefore, the site is recommended for Construction Complete classification.